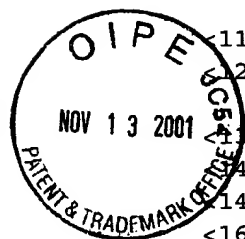


SEQUENCE LISTING



<110> Terumo Corporation
<120> Functional Hybrid Polypeptide with Collagen-binding
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<130> 19990120
<140> WO, PCT/JP00/00964
<141> 21.02.00
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Fibronectin Collagen-Binding Domain
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<222> (2)..(341)
<223> /note="human fibronectin collagen-binding domain"
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35 40 45
Asn Gly Val Ser Cys Gln Glu Thr Ala Val Thr Gln Thr Tyr Gly Gly
50 55 60
Asn Ser Asn Gly Glu Pro Cys Val Leu Pro Phe Thr Tyr Asn Gly Arg
65 70 75 80
Thr Phe Tyr Ser Cys Thr Thr Glu Gly Arg Gln Asp Gly His Leu Trp
85 90 95
Cys Ser Thr Thr Ser Asn Tyr Glu Gln Asp Gln Lys Tyr Ser Phe Cys
100 105 110
Thr Asp His Thr Val Leu Val Gln Thr Arg Gly Gly Asn Ser Asn Gly
115 120 125
Ala Leu Cys His Phe Pro Phe Leu Tyr Asn Asn His Asn Tyr Thr Asp
130 135 140
Cys Thr Ser Glu Gly Arg Arg Asp Asn Met Lys Trp Cys Gly Thr Thr
145 150 155 160
Gln Asn Tyr Asp Ala Asp Gln Lys Phe Gly Phe Cys Pro Met Ala Ala
165 170 175

His	Glu	Glu	Ile	Cys	Thr	Thr	Asn	Glu	Gly	Val	Met	Tyr	Arg	Ile	Gly
			180					185					190		
Asp	Gln	Trp	Asp	Lys	Gln	His	Asp	Met	Gly	His	Met	Met	Arg	Cys	Thr
		195					200					205			
Cys	Val	Gly	Asn	Gly	Arg	Gly	Glu	Trp	Thr	Cys	Ile	Ala	Tyr	Ser	Gln
	210					215					220				
Leu	Arg	Asp	Gln	Cys	Ile	Val	Asp	Asp	Ile	Thr	Tyr	Asn	Val	Asn	Asp
225					230					235					240
Thr	Phe	His	Lys	Arg	His	Glu	Glu	Gly	His	Met	Leu	Asn	Cys	Thr	Cys
			245					250						255	
Phe	Gly	Gln	Gly	Arg	Gly	Arg	Trp	Lys	Cys	Asp	Pro	Val	Asp	Gln	Cys
		260					265						270		
Gln	Asp	Ser	Glu	Thr	Gly	Thr	Phe	Tyr	Gln	Ile	Gly	Asp	Ser	Trp	Glu
	275					280					285				
Lys	Tyr	Val	His	Gly	Val	Arg	Tyr	Gln	Cys	Tyr	Cys	Tyr	Gly	Arg	Gly
	290					295					300				
Ile	Gly	Glu	Trp	His	Cys	Gln	Pro	Leu	Gln	Thr	Tyr	Pro	Ser	Ser	Ser
305					310					315					320
Gly	Pro	Val	Glu	Val	Phe	Ile	Thr	Glu	Thr	Pro	Ser	Gln	Pro	Asn	Ser
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			340												

<210> 2

<211> 159

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Human Basic
Fibroblast Growth Factor with Enterokinase
Recognition Sequence

<220>

<221> PEPTIDE

<222> (1)..(5)

<223> /note="enterokinase recognition sequence"

<220>

<221> PEPTIDE

<222> (6)..(159)

<223> /note="human fibroblast growth factor"

<400> 2

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Pro	Glu	Asp	Gly	Gly	Ser	Gly	Ala	Phe	Pro	Pro	Gly	His	Phe	Lys	Asp
	20						25					30			
Pro	Lys	Arg	Leu	Tyr	Cys	Lys	Asn	Gly	Gly	Phe	Phe	Leu	Arg	Ile	His
	35					40						45			
Pro	Asp	Gly	Arg	Val	Asp	Gly	Val	Arg	Glu	Lys	Ser	Asp	Pro	His	Ile
	50					55					60				
Lys	Leu	Gln	Leu	Gln	Ala	Glu	Glu	Arg	Gly	Val	Val	Ser	Ile	Lys	Gly
65					70					75					80
Val	Cys	Ala	Asn	Arg	Tyr	Leu	Ala	Met	Lys	Glu	Asp	Gly	Arg	Leu	Leu
			85					90						95	
Ala	Ser	Lys	Cys	Val	Thr	Asp	Glu	Cys	Phe	Phe	Phe	Glu	Arg	Leu	Glu
			100					105						110	

Ser Asn Asn Tyr Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr
115 120 125
Val Ala Leu Lys Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly
130 135 140
Pro Gly Gln Lys Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145 150 155

<210> 3

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Human Epidermal
Growth Factor with Enterokinase Recognition
Sequence

<220>

<221> PEPTIDE

<222> (1)..(5)

<223> /note="enterokinase recognition sequence"

<220>

<221> PEPTIDE

<222> (6)..(58)

<223> /note="human epidermal growth factor"

<400> 3

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20 25 30
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35 40 45
Tyr Arg Asp Leu Lys Trp Trp Glu Leu Arg
50 55

<210> 4

<211> 501

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Hybrid
Polypeptide of Human Fibronectin Collagen-Binding
Domain and Human Basic Fibroblast Growth Factor

<220>

<221> INIT _MET

<222> (1)

<220>

<221> DOMAIN

<222> (2)..(341)

<223> /note="human fibronectin collagen-binding domain"

<220>

<221> PEPTIDE

<222> (343)..(347)

<223> /note="enterokinase recognition sequence"

<220>

<221> PEPTIDE

<222> (348)..(501)

<223> /note="human fibroblast growth factor"

<400> 4

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Gly	His	Cys	Val	Thr	Asp	Ser	Gly	Val	Val	Tyr	Ser	Val	Gly	Met	Gln
			20					25					30		
Trp	Leu	Lys	Thr	Gln	Gly	Asn	Lys	Gln	Met	Leu	Cys	Thr	Cys	Leu	Gly
		35					40					45			
Asn	Gly	Val	Ser	Cys	Gln	Glu	Thr	Ala	Val	Thr	Gln	Thr	Tyr	Gly	Gly
	50					55					60				
Asn	Ser	Asn	Gly	Glu	Pro	Cys	Val	Leu	Pro	Phe	Thr	Tyr	Asn	Gly	Arg
65					70					75					80
Thr	Phe	Tyr	Ser	Cys	Thr	Thr	Glu	Gly	Arg	Gln	Asp	Gly	His	Leu	Trp
				85					90					95	
Cys	Ser	Thr	Thr	Ser	Asn	Tyr	Glu	Gln	Asp	Gln	Lys	Tyr	Ser	Phe	Cys
			100					105					110		
Thr	Asp	His	Thr	Val	Leu	Val	Gln	Thr	Arg	Gly	Gly	Asn	Ser	Asn	Gly
		115					120					125			
Ala	Leu	Cys	His	Phe	Pro	Phe	Leu	Tyr	Asn	Asn	His	Asn	Tyr	Thr	Asp
	130					135					140				
Cys	Thr	Ser	Glu	Gly	Arg	Arg	Asp	Asn	Met	Lys	Trp	Cys	Gly	Thr	Thr
145					150					155					160
Gln	Asn	Tyr	Asp	Ala	Asp	Gln	Lys	Phe	Gly	Phe	Cys	Pro	Met	Ala	Ala
				165					170					175	
His	Glu	Glu	Ile	Cys	Thr	Thr	Asn	Glu	Gly	Val	Met	Tyr	Arg	Ile	Gly
			180					185					190		
Asp	Gln	Trp	Asp	Lys	Gln	His	Asp	Met	Gly	His	Met	Met	Arg	Cys	Thr
		195					200					205			
Cys	Val	Gly	Asn	Gly	Arg	Gly	Glu	Trp	Thr	Cys	Ile	Ala	Tyr	Ser	Gln
	210					215					220				
Leu	Arg	Asp	Gln	Cys	Ile	Val	Asp	Asp	Ile	Thr	Tyr	Asn	Val	Asn	Asp
225				230						235					240
Thr	Phe	His	Lys	Arg	His	Glu	Glu	Gly	His	Met	Leu	Asn	Cys	Thr	Cys
				245					250					255	
Phe	Gly	Gln	Gly	Arg	Gly	Arg	Trp	Lys	Cys	Asp	Pro	Val	Asp	Gln	Cys
			260					265					270		
Gln	Asp	Ser	Glu	Thr	Gly	Thr	Phe	Tyr	Gln	Ile	Gly	Asp	Ser	Trp	Glu
		275					280					285			
Lys	Tyr	Val	His	Gly	Val	Arg	Tyr	Gln	Cys	Tyr	Cys	Tyr	Gly	Arg	Gly
	290					295					300				
Ile	Gly	Glu	Trp	His	Cys	Gln	Pro	Leu	Gln	Thr	Tyr	Pro	Ser	Ser	Ser
305					310					315					320
Gly	Pro	Val	Glu	Val	Phe	Ile	Thr	Glu	Thr	Pro	Ser	Gln	Pro	Asn	Ser
				325					330					335	
His	Pro	Ile	Gln	Trp	Leu	Asp	Asp	Asp	Asp	Lys	Ala	Ala	Gly	Ser	Ile
			340					345					350		
Thr	Thr	Leu	Pro	Ala	Leu	Pro	Glu	Asp	Gly	Gly	Ser	Gly	Ala	Phe	Pro
		355					360					365			
Pro	Gly	His	Phe	Lys	Asp	Pro	Lys	Arg	Leu	Tyr	Cys	Lys	Asn	Gly	Gly
	370					375					380				
Phe	Phe	Leu	Arg	Ile	His	Pro	Asp	Gly	Arg	Val	Asp	Gly	Val	Arg	Glu
385					390					395					400
Lys	Ser	Asp	Pro	His	Ile	Lys	Leu	Gln	Leu	Gln	Ala	Glu	Glu	Arg	Gly

				405					410					415			
Val	Val	Ser	Ile	Lys	Gly	Val	Cys	Ala	Asn	Arg	Tyr	Leu	Ala	Met	Lys		
			420					425					430				
Glu	Asp	Gly	Arg	Leu	Leu	Ala	Ser	Lys	Cys	Val	Thr	Asp	Glu	Cys	Phe		
		435					440					445					
Phe	Phe	Glu	Arg	Leu	Glu	Ser	Asn	Asn	Tyr	Asn	Thr	Tyr	Arg	Ser	Arg		
	450					455					460						
Lys	Tyr	Thr	Ser	Trp	Tyr	Val	Ala	Leu	Lys	Arg	Thr	Gly	Gln	Tyr	Lys		
465					470					475					480		
Leu	Gly	Ser	Lys	Thr	Gly	Pro	Gly	Gln	Lys	Ala	Ile	Leu	Phe	Leu	Pro		
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<210> 5

<211> 400

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Hybrid
Polypeptide of Human Fibronectin Collagen-Binding
Domain and Human Epidermal Growth Factor

<220>

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<222> (1)

<220>

<221> DOMAIN

<222> (2)..(341)

<223> /note="human fibronectin collagen-binding domain"

<220>

<221> PEPTIDE

<222> (343)..(347)

<223> /note=" enterokinase recognition sequence"

<220>

<221> PEPTIDE

<222> (348)..(400)

<223> /note="human epidermal growth factor"

<400> 5

Met	Ala	Ala	Val	Tyr	Gln	Pro	Gln	Pro	His	Pro	Gln	Pro	Pro	Pro	Tyr		
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Gly	His	Cys	Val	Thr	Asp	Ser	Gly	Val	Val	Tyr	Ser	Val	Gly	Met	Gln		
		20					25					30					
Trp	Leu	Lys	Thr	Gln	Gly	Asn	Lys	Gln	Met	Leu	Cys	Thr	Cys	Leu	Gly		
	35					40					45						
Asn	Gly	Val	Ser	Cys	Gln	Glu	Thr	Ala	Val	Thr	Gln	Thr	Tyr	Gly	Gly		
	50				55					60							
Asn	Ser	Asn	Gly	Glu	Pro	Cys	Val	Leu	Pro	Phe	Thr	Tyr	Asn	Gly	Arg		
65				70				75						80			
Thr	Phe	Tyr	Ser	Cys	Thr	Thr	Glu	Gly	Arg	Gln	Asp	Gly	His	Leu	Trp		
			85				90						95				
Cys	Ser	Thr	Thr	Ser	Asn	Tyr	Glu	Gln	Asp	Gln	Lys	Tyr	Ser	Phe	Cys		
	100						105					110					
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 <211> 1053
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 Fibronectin Collagen-Binding Domain
 <220>
 <221> conflict
 <222> (109)
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 <222> (206)
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 <221> conflict
 <222> (270)
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 <222> (374)
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 <221> conflict
 <222> (681)
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 acacaaggaa ataagcaaatt gctttgcacg tgcctgggca acggagtcag ctgccaagag 180
 acagctgtaa cccagactta cgggtggcaac tcaaattggag agccatgtgt cttaccattc 240
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 tgggtgcagca caacttcgaa ttatgagcag gaccagaaat actctttctg cacagaccac 360
 actgttttgg ttcagactcg aggaggaaat tccaatgggtg ccttgtgcca cttccccttc 420
 ctatacaaca accacaatta cactgattgc acttctgagg gcagaagaga caacatgaag 480
 tgggtgtggga ccacacagaa ctatgatgcc gaccagaagt ttgggttctg ccccatgggt 540
 gcccacgagg aaatctgcac aaccaatgaa ggggtcatgt accgcattgg agatcagtgg 600
 gataagcagc atgacatggg tcacatgatg aggtgcacgt gtgttgggaa tggtcgtggg 660
 gaatggacat gcattgccta ctgcagctt cgagatcagt gcattgttga tgacatcact 720
 tacaatgtga acgacacatt ccacaagcgt catgaagagg ggcacatgct gaactgtaca 780
 tgcttcggtc agggtcgggg caggtggaag tgtgatcccg tcgaccaatg ccaggattca 840
 gagactggga cgttttatca aattggagat tcatgggaga agtatgtgca tgggtgtcaga 900
 taccagtgtc actgctatgg ccgtggcatt ggggagtggc attgccaacc ttacagacc 960
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 <213> Artificial Sequence
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 <223> Description of Artificial Sequence:PCR Sense
 Primer for Human Basic Fibroblast Growth Factor
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 <210> 10

<211> 31
 <212> DNA
 <213> Artificial Sequence
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 <223> Description of Artificial Sequence:PCR Antisense
 Primer for Human Basic Fibroblast Growth Factor
 <400> 10
 ggaattctca gctcttagca gacattggaa g 31
 <210> 11
 <211> 489
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 <223> Description of Artificial Sequence:Human Basic
 Fibroblast Growth Factor with Enterokinase
 Recognition Sequence
 <220>
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 <222> (228)
 <223> /note="mutation caused by polymerase chain
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 aacggggggct tcttcctgcg catccacccc gacggccgag ttgacggggg ccgggagaag 180
 agcgaccctc acatcaagct acaacttcaa gcagaagaga gaggagtcgt gtctatcaaa 240
 ggagtgtgtg ctaaccgtta cctggctatg aaggaagatg gaagattact ggcttctaaa 300
 tgtgttacgg atgagtgttt cttttttgaa cgattggaat ctaataacta caatacttac 360
 cggtaagga aatacaccag ttggtatgtg gcactgaaac gaactgggca gtataaactt 420
 ggatccaaaa caggacctgg gcagaaagct atactttttc ttccaatgtc tgctaagagc 480
 tgagaattc 489
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 <211> 44
 <212> DNA
 <213> Artificial Sequence
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 <223> Description of Artificial Sequence:PCR Sense
 Primer for Human Epidermal Growth Factor
 <400> 12
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 <210> 13
 <211> 30
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence:PCR Antisense
 Primer for Human Epidermal Growth Factor
 <400> 13
 gaattcttag cgcagttccc accacttcag 30
 <210> 14
 <211> 186
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Human Epidermal
Growth Factor with Enterokinase Recognition
Sequence

<400> 14

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ctccatgatg gtgtgtgcat gtatattgaa gcattggaca agtatgcatg caactgtgtt 120
gttggtctaca tcggggagcg atgtcagtac cgagacctga agtgggtggga actgcgctaa 180
gaattc                                             186
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<210> 15

<211> 1527

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Hybrid
Polypeptide of Human Fibronectin Collagen-Binding
Domain and Human Fibroblast Growth Factor

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acacaaggaa ataagcaaat gctttgcacg tgcctgggca acggagtcag ctgccaagag 180
acagctgtaa cccagactta cgggtggcaac tcaaattggag agccatgtgt cttaccattc 240
acctacaatg gcaggacgtt ctactcctgc accacagaag ggcgacagga cggacatctt 300
tggtgcagca caacttcgaa ttatgagcag gaccagaaat actctttctg cacagaccac 360
actgttttgg ttcagactcg aggaggaaat tccaatgggtg ccttgtgcca cttccccttc 420
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tggtgtggga ccacacagaa ctatgatgcc gaccagaagt ttgggttctg ccccatggct 540
gccacgagg aaatctgcac aaccaatgaa ggggtcatgt accgcattgg agatcagtgg 600
gataagcagc atgacatggg tcacatgatg aggtgcacgt gtgttgggaa tggtcgtggg 660
gaatggacat gcattgccta ctgcagctt cgagatcagt gcattgttga tgacatcact 720
tacaatgtga acgacacatt ccacaagcgt catgaagagg ggcacatgct gaactgtaca 780
tgcttcggtc agggtcgggg caggtggaag tgtgatcccg tcgaccaatg ccaggattca 840
gagactggga cgttttatca aattggagat tcatgggaga agtatgtgca tgggtgtcaga 900
taccagtgtc actgctatgg ccgtggcatt ggggagtggc attgccaacc tttacagacc 960
tatccaagct caagtgggtc tgtcgaagta tttatcactg agactccgag tcagcccaac 1020
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cccgccttgc ccgaggatgg cggcagcggc gccttcccgc ccggccactt caaggacccc 1140
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gacgggggtc gggagaagag cgacctcac atcaagctac aacttcaagc agaagagaga 1260
ggagtcgtgt ctatcaaagg agtgtgtgct aaccgttacc tggctatgaa ggaagatgga 1320
agattactgg cttctaaatg tgttacggat gagtgtttct tttttgaacg attggaatct 1380
aataactaca atacttaccg gtcaaggaaa tacaccagtt ggtatgtggc actgaaacga 1440
actgggcagt ataaacttgg atccaaaaca ggacctgggc agaaagctat actttttctt 1500
ccaatgtctg ctaagagctg agaattc                                             1527
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<210> 16

<211> 1224

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Hybrid
Polypeptide of Human Fibronectin Collagen-Binding
Domain and Human Epidermal growth factor

<400> 16

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acacaaggaa	ataagcaa	gctttgcacg	tgcttgggca	acggagtcag	ctgccaagag	180
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actgttttgg	ttcagactcg	aggaggaa	at	cttggtg	ccttctgcca	420
ctatacaaca	accacaatta	cactgattgc	acttctgagg	gcagaagaga	caacatgaag	480
tgggtgtggga	ccacacagaa	ctatgatgcc	gaccagaagt	ttgggttctg	ccccatggct	540
gcccacgagg	aaatctgcac	aaccaatgaa	ggggtcatgt	accgcattgg	agatcagtgg	600
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gaatggacat	gcattgccta	ctcgcagctt	cgagatcagt	gcattgttga	tgacatcact	720
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tgcttcggtc	agggtcgggg	caggtggaag	tgtgatcccg	tcgaccaatg	ccaggattca	840
gagactggga	cgttttatca	aattggagat	tcatgggaga	agtatgtgca	tgggtgtcaga	900
taccagtgtc	actgctatgg	ccgtggcatt	ggggagtggc	attgccaacc	tttacagacc	960
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tcccacccca	tccagtggct	cgacgacgat	gataagaata	gtgactctga	atgtcccctg	1080
tcccacgatg	ggtactgcct	ccatgatggg	gtgtgcatgt	atattgaagc	attggacaag	1140
tatgcatgca	actgtgttgt	tggctacatc	ggggagcgat	gtcagtaccg	agacctgaag	1200
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